

## Redescription of *Urothoe grimaldii japonica* (Amphipoda: Urothoidae) from Korea

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### ABSTRACT

The Korean gammaridean amphipods were collected from the coastal shallow waters of Korea during 1998-2001. Among them, *Urothoe grimaldii japonica* Hirayama is new to Korean fauna. Redescription of this species was made in detail with figures.

**Key words:** *Urothoe*, Urothoidae, Amphipoda, Korea

### INTRODUCTION

Gammaridean amphipod is the most numerous and diverse group of the benthic crustaceans and very important as a food source for larger crustaceans and fish. Among them, family Urothoidae constitutes an important component of many littoral marine soft-bottom fauna. A total of 52 species of 6 genera (3 in *Carangolia*, 1 in *Cunicus*, 1 in *Pseudurothoe*, 1 in *Urothopsis*, 10 in *Urothoides* and 36 in *Urothoe*) have been reported worldwide (Barnard and Karaman, 1991). One urothoid amphipod, *Urothoe convexa*, was reported in Korea by Kim and Kim (1991). Since then, there is no report in this taxon. We collected a number of urothoid amphipods from the shallow coastal waters of Korea during 1998-2001. They belong to *Urothoe grimaldii japonica* (Hirayama, 1988). This subspecies is newly reported in the Korean fauna. In this paper, we made a description of this subspecies based on the samples collected from Korea.

### MATERIALS AND METHODS

Specimens were collected mainly using a light-trap and scooped with a fine mesh hand-net from the shallow waters of Korea. Amphipods were fixed with 80% ethyl alcohol and dissected in glycerol on cobb's aluminium hollow slide. Drawings and measurements were performed with the aid of a drawing tube. The body length was measured from the

tip of rostrum to apex of the telson, along the dorsal margin of the body. All the specimens examined were deposited in the research collection of the Ecosystem Survey Team, National Institute of Environmental Research.

### SYSTEMATIC ACCOUNTS

Order Amphipoda Latreille, 1816

Suborder Gammaridean Latreille, 1803

Family Urothoidae Bousfield, 1978

Genus *Urothoe* Dana, 1852

<sup>1</sup>\**Urothoe grimaldii japonica* Hirayama, 1988

(Figs 1-5)

*Urothoe grimaldii japonica* Hirayama, 1988, p. 66, figs 289-293.

**Material examined.** 5♂♂, 13♀♀, Saemangeum (Buan-gun), 17 Jul. 2001 (I. H. Kim); 1♀, Bogildo-Is., 22 May 1998 (Y. Eun).

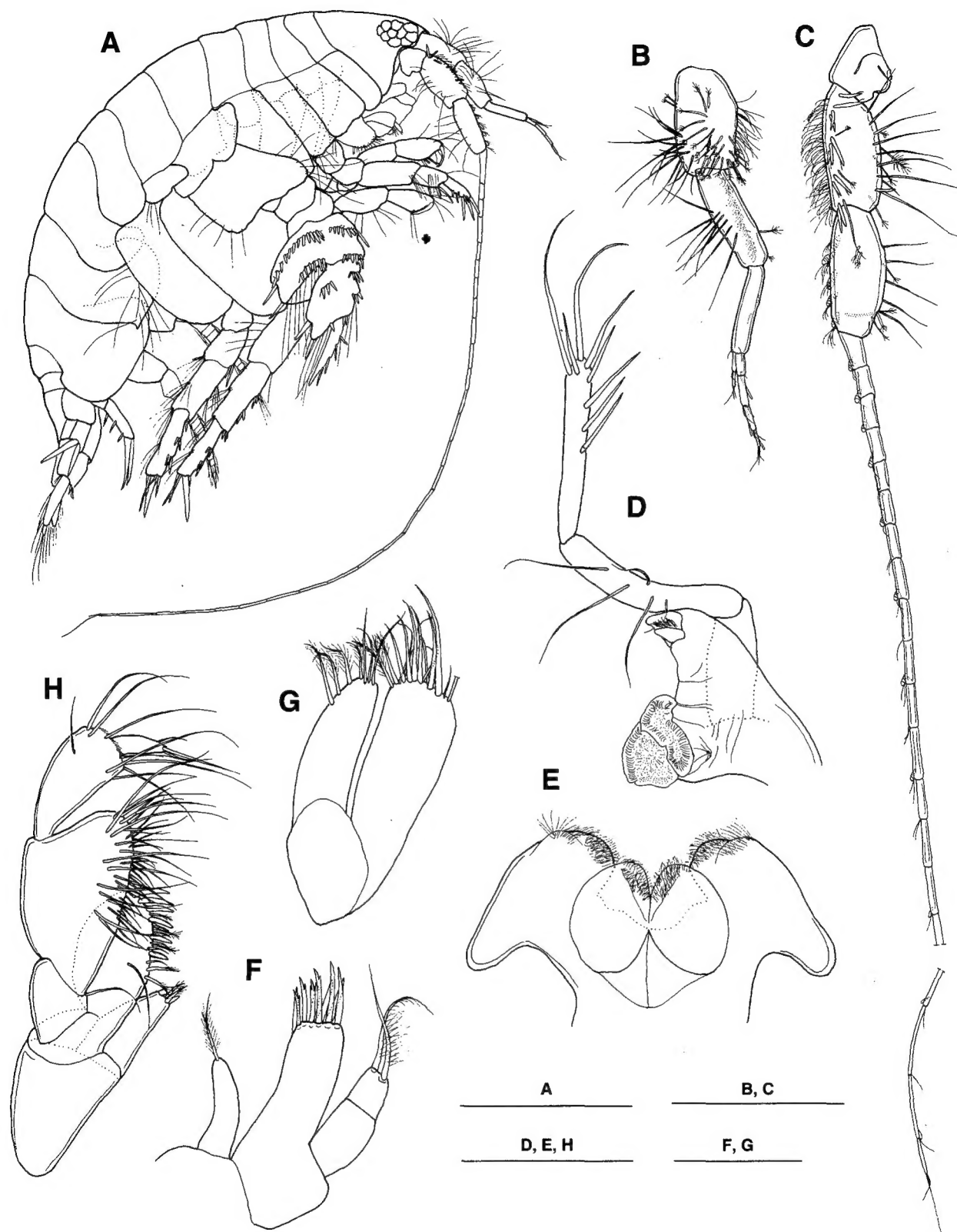
**Description.** Adult male. Body length (Fig. 1A) about 3.3 mm, broad fusiform. Head with short rostrum; eye large, circular; ventral margin of head rounded distally.

Antenna 1 (Fig. 1B). Short; length ratio of peduncular articles 1-3=1:0.97:0.82; peduncular article 1 stout, with plumose setae on inner margin, 16 setae on dorsal edge; peduncular article 2 with 8 long setae on dorsal margin; a row of setal tufts on outer margin of peduncular articles 1-2; peduncular articles 3 slender; flagellum longer than peduncular article 3, composed of 4 segments, proximal three segments with 1 aesthetasc apically; accessory flagellum 2-segmented.

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**Fig. 1.** *Urothoe grimaldii japonica*, male, 3.3 mm. A, habitus, lateral; B, antenna 1; C, antenna 2; D, mandible; E, lower lip; F, maxilla 1; G, maxilla 2; H, maxilliped. Scale bars=0.8 mm (A), 0.4 mm (B, C), 0.2 mm (D, E, H), 0.1 mm (F, G).

Antenna 2 (Fig. 1C). Slightly longer than body length, 4.7 times as long as antenna 1; peduncular articles 1-3 short; peduncular article 4 as long as 5, with 1 row of 4 groups (4, 3, 2 and 2 spines) of spines on the upper-outer side, 1 spine and 1 row of 8 long setae on ventral margin; setal tufts on dorsal edge of peduncular articles 4-5; 5 barrel-shaped calceoli on dorsal edge of peduncular article 5, 5 long setae on ventral margin; its flagellum 28-segmented, 3.66 times as long as peduncle; each flagellum segment with small calceoli.

Mandible (Fig. 1D). Incisor and lacinia mobilis very simple; with molar process truncate; accessory spines absent; palp triarticulate; length ratio of articles 1-3=1 : 1.62 : 1.58.

Lower lip (Fig. 1E). Outer and inner lobes with densely pubescent on inner margin.

Maxilla 1 (Fig. 1F). Inner plate bearing 1 apical pinnate seta; outer plate apically with 10 serrate teeth, palp article 2 with 2 pinnate setae apically.

Maxilla 2 (Fig. 1G). Inner plate narrower than outer plate, provided with 4 pinnate setae almost inner-distally and 4 simple setae apically; outer plate provided with 2 thick pinnate, 6 thick simple and 6 simple setae apically.

Maxilliped (Fig. 1H). Inner plate with 2 conical teeth and 2 penicillate setae apically; outer plate with 6 teeth, 5 penicillate setae and 5 simple setae; palp 4-articulated, article 2 prominently expanded, densely setose medially.

Gnathopod 1 (Fig. 2A). Coxa 1 narrow, lower margin round; basis 0.36 times as long as gnathopod 1, posterior margin with 18 long setae; ischium with 2 setae on posterior margin; carpus expanded, posterior margin and inner side with many and 6 setae, respectively; propodus 0.67 times as broad as width of carpus, 0.78 times as long as carpus, with 1 spine, 6 long and 7 short setae on posterodistal margin, anterodistal margin with 7 thick setae; dactylus 0.71 times length of propodus, falcate.

Gnathopod 2 (Fig. 2B). Coxa 2 rectangular, posterior distal margin with 2 plumose and 2 simple setae; basis slightly shorter than 1/2 length of gnathopod 2, with 20 long setae on posterior margin and 1 long and 1 short setae on inner side; ischium with 8 long setae on posterior margin; merus with 2 setae posterior margin and 1 seta on inner side; carpus 1.45 times length of propodus, expanded, ventral margin and inner side with many and 5 setae, respectively, anterior margin with 2 setae; propodus 0.86 times as broad as width of carpus, palm with 1 spine and many setae on posterior margin, anterior margin with many setae, inner side with 1 long seta; dactylus 1/2 length of propodus, falcate.

Pereopod 3 (Fig. 2C). Coxa 3 rectangular, posterodistal margin with 5 plumose setae; basis longer than 1/3 length of

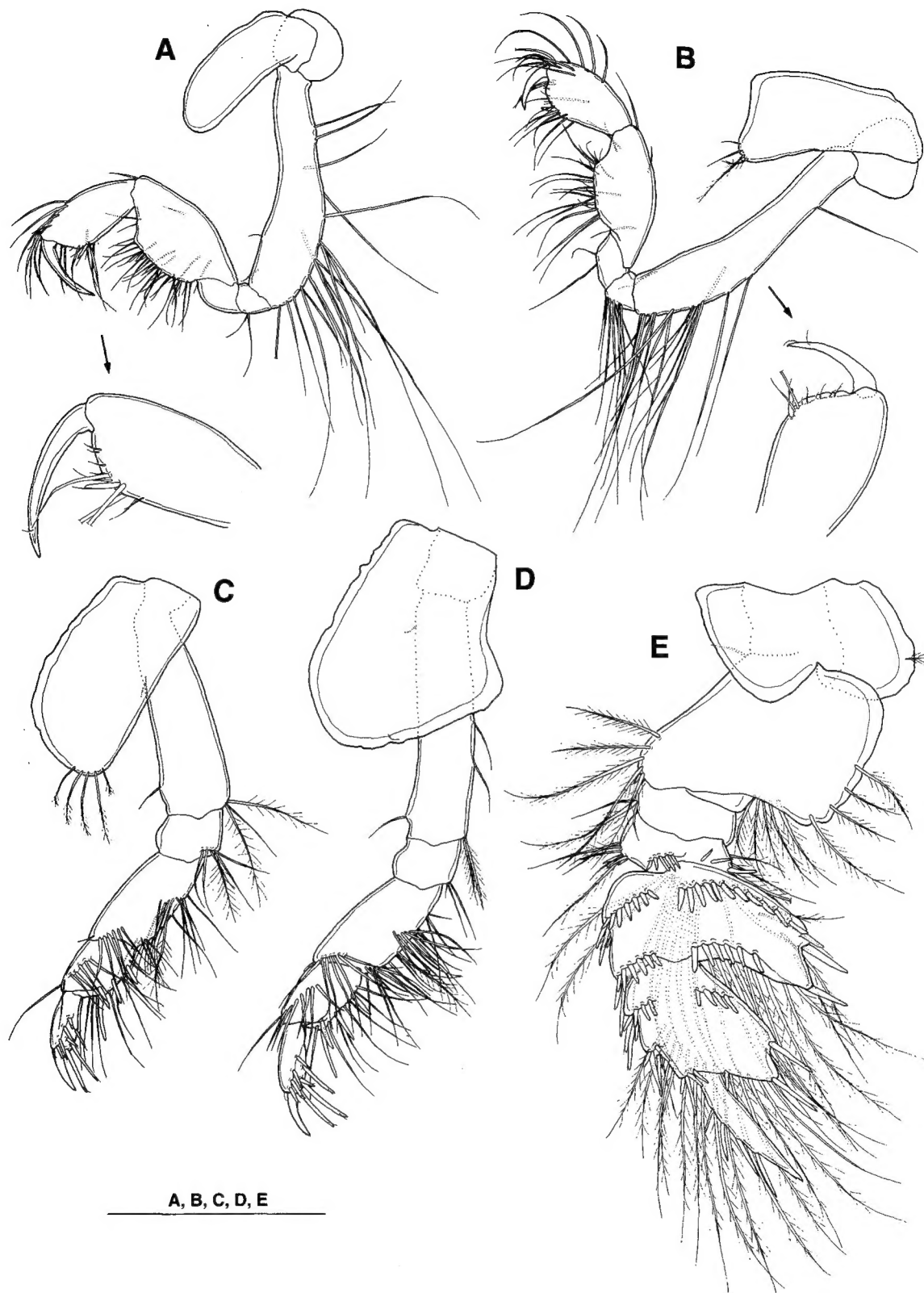
pereopod 3, posterodistal margin with 2 plumose and 1 simple setae, anterior margin with 2 setae; ischium with 1 plumose and 5 simple setae on distal margin; merus longer than length of carpus and propodus combined, with 1 plumose and many simple setae; carpus with 4 spines and many setae; propodus with 2 rows of 3 or 4 spines and a spine; dactylus falcate.

Pereopod 4 (Fig. 2D). Coxa 4 expanded posteroventrally, rounded ventrally; basis shorter than 1/2 length of pereopod 4, posterior margin with 2 simple and 2 plumose setae, anterior margin with 2 setae; ischium with 2 long and 1 short setae on posterodistal margin; merus, carpus, propodus and dactylus similar as in pereopod 3.

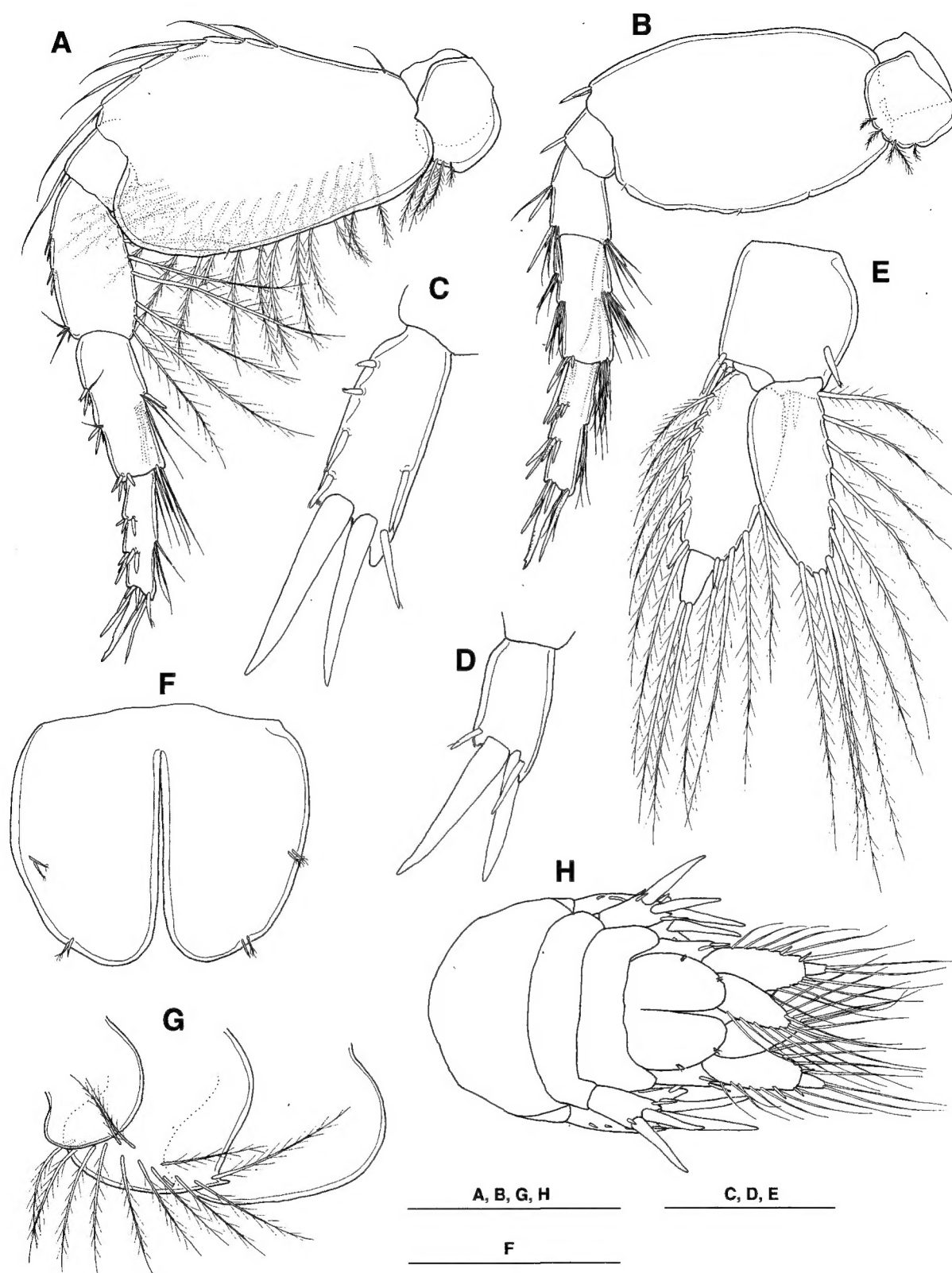
Pereopod 5 (Fig. 2E). Stout, coxa with 1 plumose seta on posterior margin; basis rectangular, slightly longer than 1/5 length of pereopod 5, posterodistal and ventral margins with 9 plumose setae, anterodistal margin with 1 spine and 5 plumose setae; ischium with 1 plumose and 2 simple setae on anterodistal margin; merus with 2 spines and 5 plumose and 1 simple setae on anterodistal margin, ventral margin of inner and outer side with 8 spines and 9 plumose setae, respectively, posterior margin with 6 plumose setae; carpus prominently expanded distalward to 2.8 times as broad as long, anterior and posterior sides with 2 transverse rows of spines, respectively, ventral margin with 9 plumose setae, inner side with 4 plumose setae; propodus gradually increasing in width, anterior and posterior sides with 1 transverse row of spines, respectively, anteromedial and anterodistal margins with spines, posterodistal margin with 2 spines, ventral and posterior margins with 1 spine and 15 plumose setae; dactylus sword-formed, tapered, anterior margin with 4 slender spines.

Pereopod 6 (Fig. 3A). Coxa 6 with 4 plumose setae; length ratio of segments from basis to dactylus almost 10 : 2 : 5 : 5 : 4 : 3; basis oblong, a little gradually widening, posterior inner side with 7 plumose setae, anterior margin with 2 setae and 5 sets of 1 spine and 1 seta; anterodistal margin of ischium with 1 spine and 1 seta; anterior margin of merus with 2 rows of 2 spines and a set of 2 spines and 2 setae, posterior margin with 7 plumose setae; anterior margin of carpus with 5 spines and 2 sets of 3 spines and 1 seta, posterior margin with 2 rows of 1 spine and 7 setae; anterior margin of propodus with 3-5-4 spines in formula, posterior margin with 3 setae and posterodistal margin with 2 spines; dactylus serrate anteriorly.

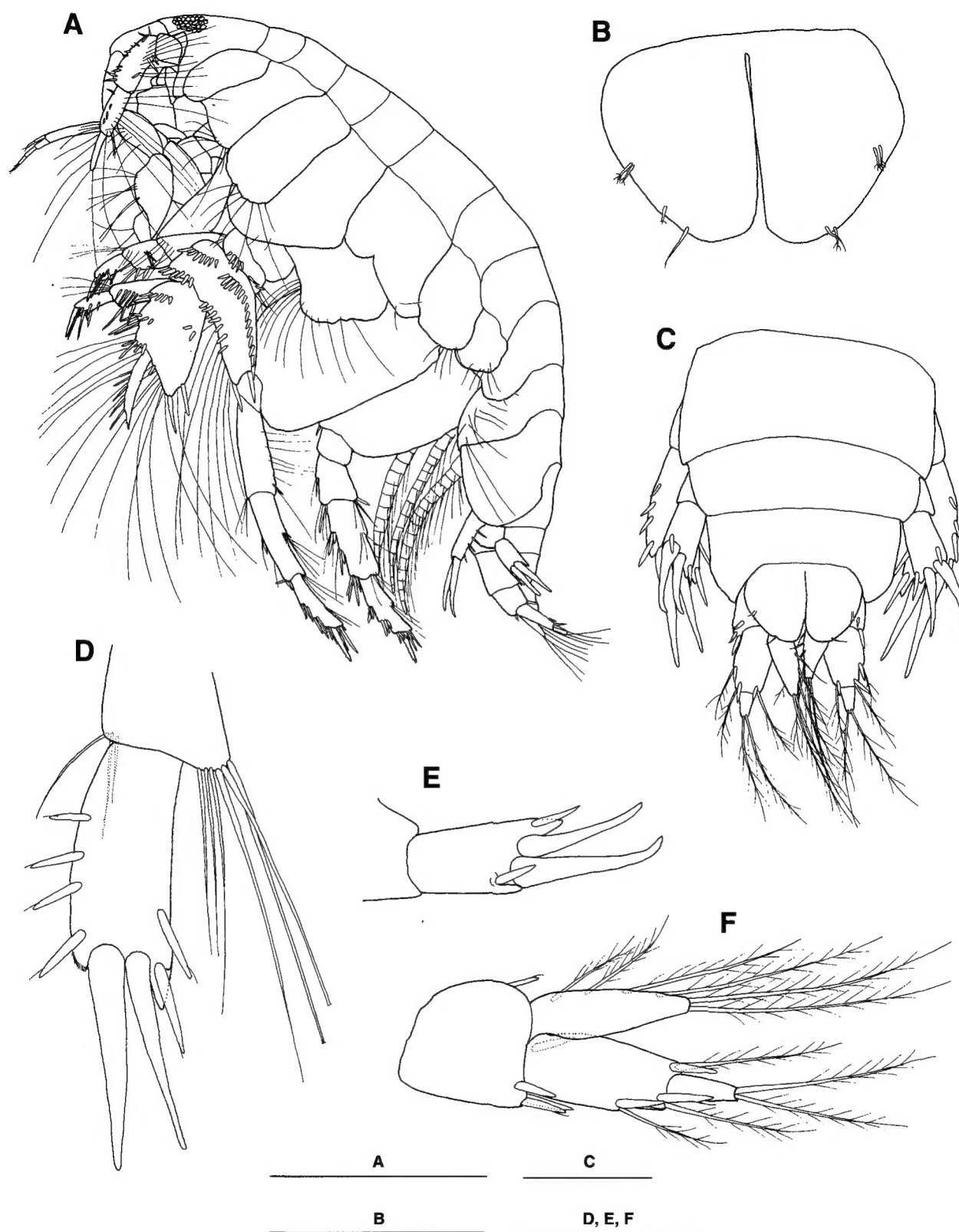
Pereopod 7 (Fig. 3B). Coxa 7 with 5 plumose setae; length ratio of segments from basis to dactylus almost 9 : 1.5 : 3 : 4 : 4.5 : 3; basis subrectangular, anterodistal margin with 2 spines; anterodistal margin of ischium with 1 spine; anterior margin of merus with a set of 2 spines and setae and a anterodistal set 2 spines and setae, posterodistal margin



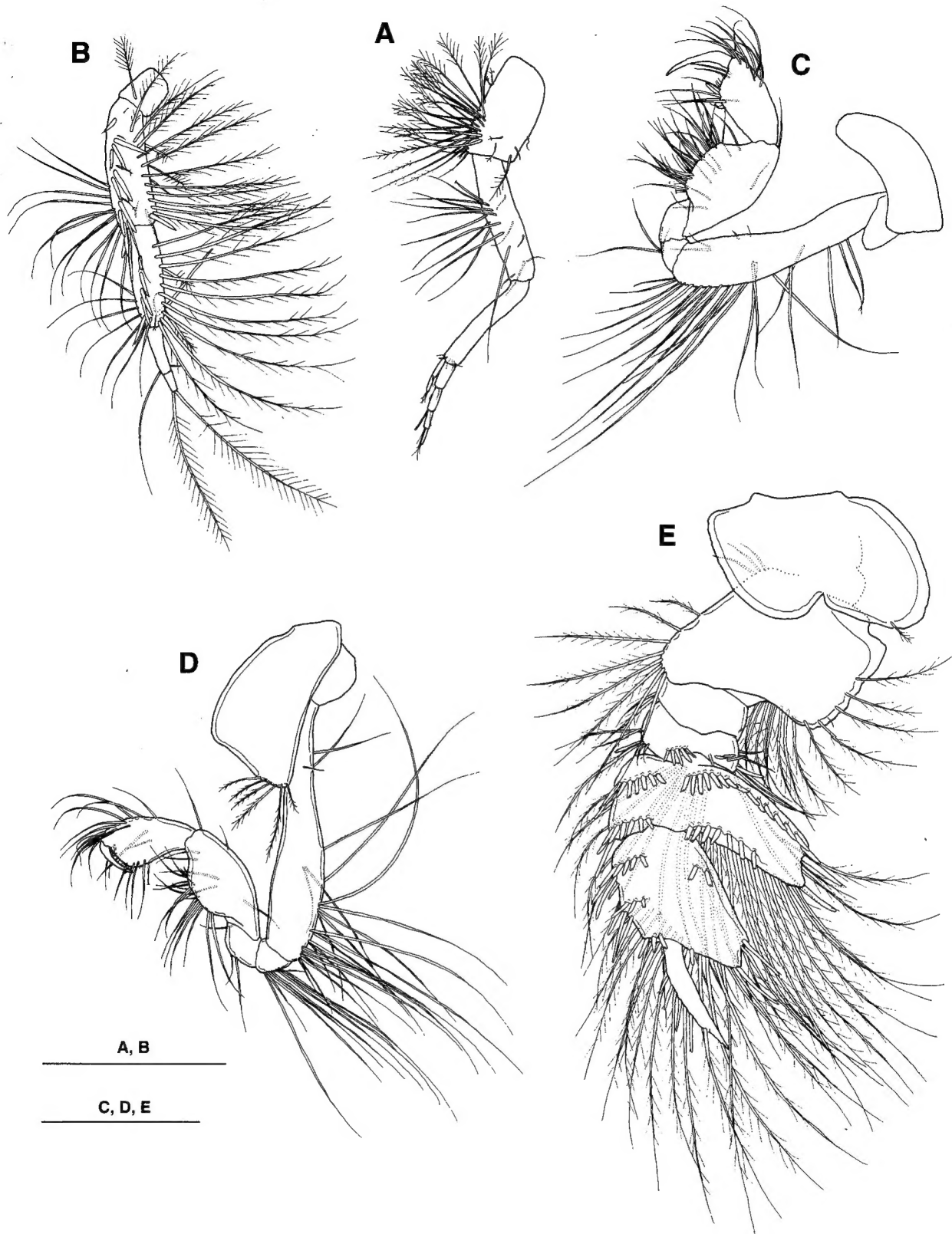
**Fig. 2.** *Urothoe grimaldii japonica*, male, 3.3 mm. A, gnathopod 1; B, gnathopod 2; C, pereopod 3; D, pereopod 4; E, pereopod 5. Scale bars=0.5 mm (A, B, C, D, E).



**Fig. 3.** *Urothoe grimaldii japonica*, male, 3.3 mm. A, pereopod 6; B, pereopod 7; C, uropod 1; D, uropod 2; E, uropod 3; F, telson; G, epimeral plates 1-3; H, urosomites and telson. Scale bars=0.5 mm (A, B, G, H), 0.2 mm (C, D, E), 0.2 mm (F).



**Fig. 4.** *Urothoe grimaldii japonica*, female, 3.9 mm. A, habitus, lateral; B, telson; C, urosomites and telson; D, uropod 1; E, uropod 2; F, uropod 3. Scale bars=1 mm (A), 0.2 mm (B), 0.3 mm (C), 0.2 mm (D, E, F).



**Fig. 5.** *Urothoe grimaldii japonica*, female, 3.9 mm. A, antenna 1; B, antenna 2; C, gnathopod 1; D, gnathopod 2; E, pereopod 5. Scale bars=0.5 mm (A, B), 0.5 mm (C, D, E).



with a spine and setae; anterior margin of carpus with 2 sets of 2 spines and setae and 7 distal spines, posterior margin with 1 spine and setae and distal setae; anterior margin of propodus with 4-5-5 spines in formula, posterior margin with 4 setae and 3 distal spines; dactylus serrate anteriorly.

Uropod 1 (Fig. 3C). Inner and outer side of peduncle with 4 and 2 spines respectively; rami naked; outer ramus longer than inner ramus.

Uropod 2 (Fig. 3D). Length shorter than uropod 1 (Fig. 3H), inner and outer distal margins of peduncle with 1 spine, respectively; rami similar to those of uropod 1.

Uropod 3 (Fig. 3E). Peduncle subsquare, outer and inner distal margins with 3 spines, respectively; rami foliaceous; inner ramus slightly over reaching to distal end of article 1 of outer ramus, with 10 long plumose setae on inner margin and outer distal margin; outer ramus biarticulate, proximal segment with 5 plumose setae and 2 distal sets of 1 spine and 1 plumose seta on outer margin, distal half of inner margin with 3 plumose setae and a distal set of 1 spine and 1 plumose seta; terminal segment with 2 plumose setae apically.

Epimeral plate (Fig. 3G). Plate 2 with 14 plumose setae, posterodistal corner produced with 1 pointed tooth.

Telson (Fig. 3F). Deeply cleft, slightly exceeding peduncle of uropod 3 (Fig. 3H), both lobes with 1 apical pair of simple and penicillate setae, and 1 outer-medial pair of penicillate setae.

Female. Body length (Fig. 4A) about 3.9 mm, broad fusiform.

Antenna 1 (Fig. 5A). Length ratio of peduncular articles  $1-3=1:1.22:1.04$ ; peduncular article 1 with 22 long plumose setae on distal half of dorsal side; peduncular article 2 with 12 long setae on dorsal side; main and accessory flagella 4 and 2 segments, respectively.

Antenna 2 (Fig. 5B). Short, slender; peduncular article 4 slightly longer than article 5, dorsal side with 1-3-2-2-2 spines in formula and 13 simple setae, ventral side with 1 spine and 11 plumose setae; peduncular article 5 with 5 spines and 7 setae, ventral side with 11 plumose setae; flagellum 2-segmented, proximal segment about 1/2 length of peduncular article 5, dorsal margin with 1 seta; terminal segment shorter than 1/2 as long as proximal segment, with 2 long plumose setae.

Gnathopod 1 (Fig. 5C). Coxa 1 narrow; basis shorter than 1/2 as long as gnathopod 1, posterior margin with long setae; carpus expanded, posterior margin with densely setae; propodus with 1 spine; dactylus falcate.

Gnathopod 2 (Fig. 5D). Coxa 2 with 6 plumose setae; basis about 1/2 length of gnathopod 2, with long setae; palm of propodus with 1 spine; dactylus falcate.

Pereopod 5 (Fig. 5E). Coxa 5 with 1 plumose setae; basis rectangular, posterodistal and ventral margins with 13 plu-

mose setae, anterodistal margins with 1 spine and 7 plumose setae; merus with 1 spines and 3 plumose and 3 simple setae on anterodistal margin, ventral margin of inner and outer sides with 10 spines and 11 plumose setae, respectively, posterior margin with 4 simple setae; carpus prominently expanding distalward to 2.9 times as broad as long, anterior and posterior sides each with 2 transverse rows of spines, ventral margin with 14 plumose setae, inner side with 3 plumose setae; propodus gradually increasing in width, anterior and posterior sides with 2 and 1 transverse rows of spines, anterodistal margin with 3 spines, posterodistal margin with 2 spines, ventral and posterior margins with 1 spine and 15 plumose setae; dactylus sword-formed, tapered, anterior margin with 5 slender spines.

Uropod 1 (Fig. 4D). Inner and outer sides of peduncle with 4 and 2 spines, respectively; rami naked; outer ramus longer than inner ramus.

Uropod 2 (Fig. 4E). Length shorter than uropod 1 (Fig. 4C), inner and outer distal margins of peduncle each with 1 spine; rami similar to those of uropod 1.

Uropod 3 (Fig. 4F). Peduncle subsquare, distal margin with 6 spines; rami foliaceous; inner ramus slightly over reaching to distal end of article 1 of outer ramus, inner and distal margins with 4 and 2 plumose setae, respectively; outer ramus biarticulate, proximal segment with 2 distal sets of 1 spine and 1 plumose seta on outer margin, distal inner margin with a distal set of 1 spine and 1 plumose seta; terminal segment with 2 plumose setae apically.

Telson (Fig. 4B). Deeply cleft, slightly exceeding peduncle of uropod 3 (Fig. 4C), both lobes with 1 apical pair of simple and penicillate setae, and 1 outer-medial pair of penicillate setae.

*Remarks.* Our specimens are well accorded with the original description (Hirayama, 1988). However, a few differences are found between our male specimens and original description; (1) in the original description peduncular article 5 of antenna 1 without calceoli, while in Korean specimens with 5 calceoli; (2) pereopod 5, dactylus with 6 slender spines, while with 4 slender spines; (3) uropod 1, peduncle with 5 outer spines, while with 2 outer spines; (4) uropod 2, peduncle with 3 outer spines, while with 1 outer spine (5) uropod 3, outer and inner margins of proximal segment with 7 and 5 pinnate setae, respectively, while with 5 and 3 plumose setae, respectively.

*Distribution.* Korea (Yellow Sea, South Sea), Japan.

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